LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI –A

WATERBODY MANAGEMENT PLAN SERIES

BUNDICK LAKE

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

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LAKE HISTORY

GENERAL INFORMATION

Parish/ location:
Bundick Lake is located 5 miles west of Dry Creek, in east central Beauregard Parish, situated in south-west Louisiana. The dam and spillway are located 500 meters north of LA Hwy 394 in Section 5 & 6, T4S, R7W (30° 44' 30" N & 093° 06' 00" W). The reservoir is located on Bundick Creek approximately 25 miles up-stream of the Calcasieu River, which drains into the Gulf of Mexico at Cameron.

Date Lake formed:
Bundick Lake was constructed in 1958/61 and reached pool elevation in1962.

Impoundment:
Bundick Lake was created by the impoundment of Bundick Creek with an earthen dam at 4,200 feet in length with a 12' crown at elevation 110.0 mean sea level (MSL). Maximum embankment height is 40 feet and is constructed of a homogenous earth fill with stone rip-rap shore protection. Lakeside embankment slope is one-on-three with a 25' and 40' wide berm.

Ownership:
The State of Louisiana owns the water bottom and the Louisiana Department of Wildlife & Fisheries (DWF) manages the fish and wildlife resources. The Louisiana Department of Transportation and Development has authority and maintenance over the levees and associated structures as per Act 270 (see below).

Size (surface acres):
Bundick Lake covers a total of 1,750 acres (57,500 acre feet storage) at 95.0 MSL.

Water shed:
An area covering 208 square miles drains into Bundick Lake. The watershed to lake to ratio is very large at 73 to 1. Watershed characteristics: Commercial pineland forest, upland hardwood, pasture. Soil is acidic, sandy, and infertile. Soil alkalinity and pH are low (< 10-12 mg/L $CaCO_3$ and 6.5-6.8, respectively). The watershed drains a medium-sized tributary of the Calcasieu River basin.

Pool stage:
95.0 feet Mean Sea Level at spillway crest. Lake levels can be monitored online at the United States Geological Survey site National Water Information System for Bundick Lake: USGS 08014881 Bundick Lake at Spillway near DeRidder, LA.

Drawdown (outlet) structure description:
Under ideal drying conditions, the reservoir can be drawn down about 3" per day with the gate opened to maximum height.
Gate size – 5 foot x 5 foot
Number of gates – 1

Construction – reinforced concrete control structure
Condition – Poor
Flow rate – 25 cfs

Spillway:
Spillway location – the spillway is located on the southern end of Bundick dam at the spillway park.
Spillway crest length – 200' at 95' MSL
Condition – poor with some weathering/pitting of concrete face as the structure is approaching 55 years of age; The LDOTD inspector's report for 2011 recommended the following corrective actions:

1. The sealant in the concrete joints of the spillway is deteriorated and should be removed and replaced.
2. Additional warning buoys should be installed at least 50 feet further upstream from the existing buoys.
3. The concrete paved ditch on the north side of the spillway is deteriorated, east of the fence line, and should be reconstructed.
4. The concrete paved ditch on the south side of the spillway should be extended to the settling basin and rip rap added to diffuse the energy.
5. A hand lever/wheel should be available to operate the drawdown gate, in the event of a power failure.
6. There are numerous animal burrows on the upstream and downstream slopes that should be repaired.
7. The barbed wire fence east of the embankment and north of the spillway is open and should be repaired, after the paved ditch is repaired.

Capacity – 38,100 cubic feet per second (cfs)
Flow rate – present spillway design flood – 17.36"/5 days

Who controls: Louisiana Department of Transportation and Development (LDOTD) is responsible for the maintenance and operation of 19 reservoir embankments, including Bundick Reservoir, to maintain their integrity and to prevent any breach or damage to the existing facilities as per RS 38:23 of Act 270 of 1984, which reads in part:
"All dams, as hereinabove described, both federal and non-federal but excluding the Toledo Bend Dam, shall be under the jurisdiction of the state acting through the chief engineer of the Department of Transportation and Development, office of public works. The chief engineer, or his authorized representative, shall have supervision and overview of the construction, modification, operation, and maintenance of the dams to the extent required to protect life and property and to provide for the safety and welfare of the public."
As per this Act, LDOTD is responsible for operating the structure for emergency flood control. While the structure does not provide flood relief, it is often opened at the request of the public and local government for this purpose. Local LDOTD operation procedures consist of opening the gate when lake elevation reaches 97' MSL and closing it when the lake returns to pool elevation (per. comm. Steve Young, LDOTD). The LDOTD is also responsible in the event of a dam breach. Emergency Action Plans for Bundick Lake are on file with the Dam Safety and Water Resources Section of LDOTD in Baton Rouge,

LA. Any non-emergency request for structure openings must be directed to the Secretary of LDOTD in writing from the Secretary of the Department of Wildlife and Fisheries (LDWF) or his designee. Verbal requests are not to be accepted. The letter from LDWF to LDOTD is to indicate the date for gate opening and the rate of drawdown desired for wildlife or lake management purposes**.** If a drawdown is requested by another agency for maintenance or repair purposes, LDWF still needs to send a letter to LDOTD. In these situations we typically request the opening and state we are not opposed to the drawdown.

Lake Authority:

Act 858 of the 1981 Legislature abolished approximately 19 special game and fish commissions including the Bundick Lake Game and Fish Commission which governed Bundick Lake. Authorities for lakes & structures were transferred to LDWF. However, parish government under state law can select/appoint a panel of interested/concerned citizens to serve on committees in an advisory capacity to the jury. Beauregard Parish has never exercised the option of appointing such a committee.

Lake Commission:

None

Private organization:

Bundick Lake Improvement Association
Irene Ducharme, President
Jerry Cobur, Vice President
Dry Creek, LA 71446

The Association is comprised of interested home and camp owners bordering or living near Bundick Lake. Membership is open to anyone interested in the use of the lake for recreation.

PUBLIC ACCESS

Boat launches:
Currently four boat ramps are associated with the public boat landings on Bundick Lake. They are located at the Spillway Park; Hopewell Bridge, Ray Coonce Landing and Clark's Landing Road **(SEE APPENDIX I – LAKE MAP W/BOAT LAUNCHES).** There are numerous private wharves and piers around the lake.

Piers:
While there are no public fishing piers on Bundick Lake, there are numerous private piers around the lake.

State/Federal facilities:
There is one state-owned facility – the Spillway boat ramp and wharf, is maintained by LDWF and DOTD. The grounds are cared for and maintained by Beauregard Parish.

Reefs:
There are currently no state-owned/operated artificial reefs.

SHORELINE DEVELOPMENT

State/National Parks:
There are currently no state or federally owned parks on Bundick Lake.

Shoreline Development by Landowners:
Approximately 40% of the shoreline is developed with homes and camps.

PHYSICAL DESCRIPTION

Shoreline length:
There are 14 miles of shoreline around Bundick Lake of which about ½ mile is armored with bulk heads, boat sheds and piers.

Timber type:
Forests surrounding Bundick Lake consist primarily of mixed upland pine/hardwood communities.

Average depth:
5.0 feet

Maximum depth:
24.0 feet

Natural seasonal water fluctuation:

0.5 – 5.0 feet

EVENTS / PROBLEMS

The floods of 1982, 1984 , 1989, and 2012:

In all three instances, massive flooding occurred when heavy rains fell on already saturated soils within the watershed. In 1984, the lake was being held at 8 feet below pool elevation (87 MSL) during a planned drawdown event. Within a 24 hour period, the lake elevation rose to 103' MSL, for a total increase of 16' in water level. It was noted that the hydrostatic pressure of the water below the spillway sent water rushing upstream through the open drawdown gate and back into the lake. In March 2012, heavy rainfall from one event raised lake elevation to over 102' MSL in less than 24 hours. All events caused considerable flooding around the shoreline.

Since impoundment of Bundick Lake in 1962, a number of private structures have been constructed below the flood design elevation of 103.00 feet MSL (1962 LDOTD correspondence, Appendix III). Because of the extensive watershed, flooding was frequent in Bundick Creek before construction of the reservoir. Future flooding is expected to occur for the same reason. Private structures exist on foundations constructed at elevations of 97.00 MSL (flood stage) and above, with flood frequency being contingent on seasonal rainfall, gulf storm events, and land use practices within the 208 square mile watershed. Additionally, flood events will become more exacerbated in the future with land use changes in the watershed. Excessive operation of the draw down gate by LDOTD for "flood control" (see who controls section above) has led to damage and untimely repairs on more than one occasion. Operation of the gate for such a purpose has negligible effect on flood relief to property owners. Since the installation of USGS gauges on Bundick Creek near DeRidder and at the spillway, residents have additional tools for forecasting flood events in the watershed.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Bundick Lake had moderate to severe aquatic plant problems due to water fertility in the early years following impoundment. Water hyacinth and alligator weed infestations were prevalent in the western and northern sections of the lake. Repeated summer/fall drawdowns of 8.0 feet below pool to control noxious plants from 1963 until 1975, combined with aggressive spraying eventually controlled the vegetation. Recent drawdowns, while employed primarily for fisheries management have further reduced the growth of submersed and emergent aquatic plants. While hyacinth still exists in small "background" amounts, the problematic invasive plant in the past ten years has been common salvinia. The drawdown in the fall of 2004 was initiated because common salvinia coverage reached >70% of the lake surface by August of that summer. A successful drawdown complemented by aggressive herbicide spraying has kept this noxious plant below the 5% level in the last eight years. Peruvian water grass was recently identified (2008) along the north shoreline of Bundick Lake.

WATER QUALITY

There are several types of pollution that have, and still are affecting Bundick Lake. Prior to 1989, a point-source discharge of domestic sewage from Fort Polk Military installation and the City of DeRidder contributed heavily (three to five million gallons daily) to the nutrient loading of Bundick Creek and Lake. Resulting plankton blooms and die-offs have resulted in extensive fish kills in the past, resulting from plankton-induced deficits in dissolved oxygen. Efforts to control water hyacinth during the 1960's and 1970 have resulted in considerable die-offs of vegetation following treatments. As the hyacinth decayed and blooming plankton died off, dissolved oxygen was removed from the water, and a considerable build-up of hydrogen sulfide (H_2S) occurred in the lower water column near the dam. There have been no reported H_2S problems since the late 1970's. The general seepage of sewage and lawn fertilizers from camps and homes adjacent to the lake continue to cause enrichment, with some controls being enforced by parish and state health officials. Silvicultural practices (clear cutting) and agricultural activities (row crops and pasture), combined with the unusually large watershed is responsible for increased "sediment loading" into Bundick Lake. The conversion of historic timber lands over time has resulted in more rapid and intensive runoff following rainfall events. This has resulted in a "delta" building process in the upper end of Bundick Lake, causing the lake to become shallower thru time. Excessive sedimentation and accompanying turbidity continue in the watershed today.

Type map:

SEE APPENDIX II for most recent type map.

Biomass:
No biomass sampling conducted.

Treatment history by year available:
Biological:
Common salvinia weevils were stocked in August 2008. Localized (<1km^2) control was observed from this stocking through spring 2009. No long term control was observed after this period.
Chemical:

Table 1. Recent herbicidal treatment measures on Bundick Lake, LA 2006 – 2010.

Year	Herbicide	Gallons	Rate gal/acre	Number of Treatments	Acres Treated	Crew Hours
2006	2,4-D	45.0	0.5	7	90	24
	AquaStar	21.0	0.75	2	28	7
	Reward	23.0	0.75	4	31	16
2007	2,4-D	24.0	0.5	3	48	12
	Aqua Master	5.0	0.75	1	7	3
	Habitat	2.5	0.5	1	3	3
	Reward	13.0	0.75	2	17	9
2008	2,4-D	161.0	0.5	12	322	51
	AquaStar	24.0	0.75	2	32	12
	CLEARCAST	26.0	0.5	4	39	16
	Polaris AQ	5.0	0.5	1	7	6
	Reward	58.0	0.75	8	76	31
2009	2,4-D	23.0	0.5	2	46	9
	Aqua Master	59.0	0.75	5	105	22
	CLEARCAST	37.0	0.5	3	74	14
2010	Aqua Master	5.0	0.75	1	7	3
	Polaris AQ	4.0	0.5	1	8	3

Table 2. Bundick Lake, LA herbicidal treatment measures for 2011.

Target Species	Herbicide	Rate gal/acre	Number of Treatments	Acreage Treated
Alligatorweed Peruvian Water Grass Primrose Salvinia Common	Glyphosate	0.75	2	54

Alligatorweed Primrose Salvinia Common Sedge Water Hyacinth	Imazamox	0.5	2	62
Alligatorweed Creeping River Grass Frogs Bit Knotweed Maidencane Pennywort Peruvian Water Grass Primrose Salvinia Common Salvinia Giant Water Hyacinth	Imazapyr	0.5	7	138

Physical:
Drawdowns have been employed in the past as the primary means to inhibit aquatic plant growth on Bundick Lake. The drawdown history of Bundick Lake is given in Table 3 and includes drawdown dates, purpose, and successes of the drawdowns.

HISTORY OF FISHING REGULATIONS

Recreational:
Statewide regulations applied for all fish species since impoundment in 1959.

Included: Black Bass (Largemouth, spotted): 15 daily of any size

April 1, 1991 - Black bass management plan was implemented with state-wide daily creel limit of 10 with no minimum length as a conservation measure. A listing of Louisiana recreational fishing regulations can be found at: http://www.wlf.louisiana.gov/regulations

Commercial:
The 2013 commercial fishing regulations may be viewed at the link below:
http://www.wlf.louisiana.gov/fishing/regulations

The use of gill nets, trammel nets, and hoop nets are prohibited in Bundick Lake.

DRAWDOWN HISTORY

Table 3. Bundick Lake, LA drawdown descriptions from 1966 – 2012.

Drawdown Date	Fall/Winter 2004/2005 – September 15 to January 15
Purpose	Control aquatic plants - salvinia
Success	Excellent
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1997/1998 – September 15 to January 15
Purpose	Correct fish imbalance
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1992/1993 – September 15 to January 15
Purpose	Correct fish imbalance
Success	Fair – excessive rainfall

Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1987-1988 – Sept. 15 to Jan. 15
Purpose	Correct imbalance of fish populations; property owner repairs
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Fall/winter 1983-1984 – Sept. 15 to Jan. 15
Purpose	Correct fish imbalance
Success	Good
Fishing Closure	No
Depth Below Pool	8 – 10’
Estimated % Exposed	60%
Who Operated Structure	DOTD
Any Fish Kills	None reported
Drawdown Date	Summer/fall 1976 – Aug. 1 to Jan. 30

Purpose	Control nuisance aquatic vegetation – water hyacinth
Success	Good
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%
Who Operated Structure	LDWF
Any Fish Kills	None reported
Drawdown Date	Summer/fall 1973 – Aug. 1 to Nov. 30
Purpose	Control nuisance aquatic vegetation – water hyacinth
Success	Fair to good
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%
Who Operated Structure	LDWF
Any Fish Kills	None reported
Drawdown Date	Summer/fall 1966-71 – Aug. 1 to Nov. 30
Purpose	Control nuisance aquatic vegetation – water hyacinth & other floating and submersed aquatic vegetation
Success	Poor to fair
Fishing Closure	No
Depth Below Pool	6 – 8’
Estimated % Exposed	50%
Who Operated Structure	LDWF
Any Fish Kills	None reported

Purpose:
The purpose of the summer/fall drawdowns from 1966 to 1971 was primarily for control of aquatic plants – submersed aquatics included *Egeria*, *Ceratophyllum*, and *Utricularia*. Emergent species included *Cephalanthus*, *Brasenia*, *Eichhornia*, and *Ludwigia*. Drawdowns in the 80's and 90's were for correcting an imbalance in sportfish populations. The drawdown of 2004-05 was for controlling an outbreak of common *Salvinia*.

Success:
Nuisance aquatic vegetation declined by the early 80's primarily due to the loss of productivity as the "new lake" effect wore off and point source sewage effluent from DeRidder and Fort Polk were controlled. Repeated drawdown's and chemical treatments during the 1960's and early 1970's were successful in controlling water hyacinth. Fisheries production was linked to aquatic plant species. When submersed vegetation declined, fish populations waned. Subsequent fall/winter drawdowns which targeted imbalances within fish populations have only resulted in short term "spikes" of increased fisheries production (three to four years). An excellent detail of Bundick Lake drawdown results can be found in the publication: "Natural and controlled water level fluctuation in a backwater lake and three Louisiana impoundments" by Kenneth Lantz, 1974.

Fishing closure:
There has never been a fishing closure on Bundick Lake during a scheduled drawdown.

Depth below pool:
Typical fall drawdowns are generally from six to eight feet (89.0 – 87.0 MSL) below normal pool.

Estimated % exposed:
At 89.0 MSL approximately 50% of the lake bottom is exposed. At 87.0 MSL approximately 70% of the bottom is exposed.

Who operated structure:
The Louisiana DOTD at LDWFs' recommendations and specifications.

Fish kills:
There have been no reported fish kills related to drawdowns.

FISH KILLS / DISEASE HISTORY

LMBV:

Largemouth bass were sampled in Bundick Reservoir in 2002 for the presence of Largemouth Bass Virus. In a sample of 11 bass, 1 fish or 9.1%, tested positive for LMBV. No LMBV kills have been documented.

Fish Kills:
There were scattered reports of dead fish following Hurricane Rita in September of 2005.

CONTAMINANTS / POLLUTION

Contaminants/pollution:
Water quality in Bundick Lake and creek is monitored regularly by the Louisiana Department of Environmental Quality (LDEQ) – Water Resources Division. Samples are taken monthly during the years the lake is surveyed. Fish flesh is tested annually by LDEQ for mercury levels. There is currently no health advisories posted for Bundick Reservoir. http://www.deq.louisiana.gov/portal/default.aspx?tabid=1631

Water quality:
The Louisiana Department of Environmental Quality (LDEQ) measures water quality in Bundick Lake each month on an annual basis. Individual sample sites are contained in the table below and parameters include dissolved oxygen, pH, temperature, alkalinity, specific conductance, total hardness, TDS, and TSS. Water quality data is available through written request at the LDEQ website at: http://www.deq.louisiana.gov/portal/DIVISIONS/WaterPermits/WaterQualityAssessment/AmbientWaterQualityMonitoringData.aspx

Table 4. Louisiana Department of Environmental Quality water quality sample site information.

Station Type	Site ID	Site Name	Site Location	Subsegment
STREAM	0834	Bundick Creek northwest of Bundick Lake	Hopewell Crossing Road bridge, (PR 291), northwest of Bundick Lake, 9.2 miles SE of Ikes	LA030506_00
LAKE	0835	Bundick Lake northwest of Dry Creek, Louisiana	end of wharf at dam boat launch in Bundick Lake, 4.9 miles NW of Dry Creek, 11.3 miles NE of Longville, 9.2 miles SW of Sugartown	LA030507_00
STREAM	0836	Bundick Creek Southeast of Dry Creek, Louisiana	at Marrow Bridge Road Bridge, 1.5 miles SE of Dry Creek, 7.5 miles SW of Mittie, 8.0 miles NW of Harmony	LA030508_00

Water level:
Normal years' experience 0.5 to 2.0 feet fluctuations above spillway crest. Lake levels can be monitored online at the United States Geological Survey (USGS) site National Water Information System for Bundick Lake: USGS 08014881 Bundick Lake at Spillway near DeRidder, LA. Current and historic data are available at:

http://waterdata.usgs.gov/la/nwis/uv/?site_no=08014881.

Fish Samples:

Gear:
In the early years (1966 – 1989) biomass (rotenone) surveys were the preferred method of sampling fish populations in Bundick Lake. Biomass surveys have been greatly scaled back primarily due to negative public sentiment. The standardized methodologies of electrofishing, gillnets, seines, leadnets, and creel surveys have been employed to assess population attributes from 1990 – 2012. Table 5 lists the historical, recent, and future sampling efforts for Bundick Lake.

Sample Type: Recent and historical fish samples by LDWF are:

A. Rotenone (standing crop estimates): 1966, 1967, 1968, 1970, 1974 - 1976, 1979, 1982, 1984, 1988, 1989 and 1993.
B. Netting: 1981 - 1990, 1992 - 2009.
C. Electro-fishing: 1989 - 2011.
D. Shoreline Seining: 1990 - 2010.
E. Creel Survey: 2002
F. Age, Growth, and Genetics of largemouth bass: 1989, 1990, 2000, 2004, 2006, 2008, and 2009.

Historical, Recent, & Future Sampling:

Table 5. The Bundick Lake, LA sampling history from 1990 – 2013.

1990	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling

1991	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1992	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1993	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Rotenone 4-one acre sets Water quality sampling
1994	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1995	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1996	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling

1997	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1998	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
1999	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
2000	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Water quality sampling
2001	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2002	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls Creel Survey
2003	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls

2004	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2005	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 3 hauls
2006	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining –4 hauls Lead nets – 3 sets Water quality sampling
2007	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2008	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 2 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2009	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling

2010	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Gill Nets - 3 samples each, 2.5, 3.0, 3.5, & 4.0 Shoreline seining – 4 hauls Water quality sampling
2011	Aquatic Type Map Electrofishing 4-15 minute samples (fall) Water quality sampling
2012	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Lead nets -3 stations (age/growth) Water Quality Sampling
2013	Aquatic Type Map Electrofishing 4-15 minute samples (spring) Lead nets -3 stations (age/growth) Water Quality Sampling Fall Drawdown
2014	Aquatic Type Map Electrofishing 4-15 minute samples (spring and fall) Lead nets: 3 stations (age/growth) Water Quality Sampling Gill Nets: 3 stations
2015	Aquatic Type Map Electrofishing 4-15 minute samples (fall) LMB Age/Growth/Mortality and stocking evaluation Water quality sampling

Age and Growth:
Age and growth of largemouth bass was determined by otolith analysis from bass collected in the fall of 1989 and spring of 1990. Largemouth bass otoliths were also collected in 2000, 2004, 2006, 2008 and 2009. Crappie age & growth analysis was conducted in 2003 and 2006.

Genetic Analysis:
Largemouth bass liver tissues from Bundick Lake have been analyzed during 1988, 2003, 2006, 2008, and 2009 for presence of the Florida strain genome (see below).

Water Quality:
Water quality parameters (pH, Temp., DO, and conductivity) are generally taken in association with LDWF fisheries samples.

Lake records:
Largemouth Bass – 11 lbs. as per photo on wall at Brewer's grocery, Hwy 394 Bundick Lake.

Stocking:

The stocking history for Bundick Reservoir is listed in Table 6. Introductions at the impoundment included: Largemouth bass (Northern and Florida sub-species, bluegill, redear, blue catfish and hybrid stripers).

Table 6. Stocking history of Bundick Lake, LA from 1961 – 2005.

Year	LMB (Florida)	LMB (Native)	Bluegill	Redear	Channel Cat	Blue Cat	Hybrid stripers
1961		X	X	X			
1981							5,070
1982						20,809	10,000
1983							10,000
1984							10,545
1985							10,000
1986	34,000						10,400
1987							10,000
1988							10,000
1989							20,000
1990							20,000
1991							20,000
1993							102,250 fry
1994							350,000 fry
2001							
2002							6,250
2003	11,125						
2004	33,950						
2005	43,300						
TOTALS	**122,375**					**20,809**	**588,265**

Species profile:

A checklist of fishes collected or historically known to occur in the Bundick Creek drainage, Beauregard Parish, Louisiana is listed in Table 7 below.

Table 7. Fishes collected or known to occur in the Bundick Creek drainage of Louisiana.

Family, Scientific and Common Names

Petromyzontidae - lampreys {2}
Ichthyomyzon castaneus Girard, 1858 - chestnut lamprey
Ichthyomyzon gagei Hubbs and Trautman, 1937 - southern brook lamprey

Polyodontidae - paddlefishes {1}
Polyodon spathula (Walbaum, 1792) – paddlefish

Lepisosteidae - gars {2}
Lepisosteus oculatus Winchell, 1864 - spotted gar
Lepisosteus osseus (Linnaeus, 1758) - longnose gar

Amiidae - bowfin {1}
Amia calva Linnaeus, 1766 – bowfin

Clupeidae - herrings {2}
Dorosoma cepedianum (Lesueur, 1818) - gizzard shad
Dorosoma petenense (Günther, 1867) - threadfin shad

Cyprinidae - carps and minnows {13}
Cyprinus carpio Linnaeus, 1758 - common carp [Introduced]
Cyprinella venusta Girard, 1856 - blacktail shiner
Hybognathus nuchalis Agassiz, 1855 - Mississippi silvery shiner
Hybopsis amnis (Hubbs, and Greene, 1951) - pallid shiner
Lythrurus fumeus (Evermann, 1892) - ribbon shiner
Lythrurus umbratilis (Girard, 1856) - redfin shiner
Notemigonus crysoleucas (Mitchill, 1814) - golden shiner
Notropis atrocaudalis Evermann, 1892 - blackspot shiner
Notropis sabinae Jordan and Gilbert, 1886 - Sabine shiner
Notropis texanus (Girard, 1856) - weed shiner
Notropis volucellus (Cope, 1865) - mimic shiner
Opsopoeodus emiliae Hay, 1881 - pugnose minnow
Pimephales vigilax (Baird and Girard, 1853) bullhead minnow

Catostomidae - suckers {4}
Erimyzon sucetta (Lacépède, 1803) - lake chubsucker
Ictiobus bubalus (Rafinesque, 1818) - smallmouth buffalo
Minytrema melanops (Rafinesque, 1820) - spotted sucker
Moxostoma poecilurum Jordan, 1877 - blacktail redhorse

Ictaluridae - North American catfishes {7}
Ameiurus melas (Rafinesque, 1820) - black bullhead
Ameiurus natalis (Lesueur, 1819) - yellow bullhead

Ictalurus furcatus (Lesueur, 1840) - blue catfish
Ictalurus punctatus (Rafinesque, 1810 - channel catfish
Noturus gyrinus (Mitchill, 1817) - tadpole madtom
Noturus nocturnus Jordan and Gilbert, 1886 - freckled madtom
Pylodictis olivaris (Rafinesque, 1818) - flathead catfish

Esocidae - pikes {1}
Esox americanus Gmelin, 1789 - redfin pickerel

Aphredoderidae - pirate perch {1}
Aphredoderus sayanus (Gilliams, 1824) - pirate perch

Atherinopsidae - New World silversides {1}
Labidesthes sicculus (Cope, 1865) - brook silverside

Fundulidae - topminnows {2}
Fundulus notatus (Rafinesque, 1820) - blackstripe topminnow
Fundulus olivaceus (Storer, 1845) - blackspotted topminnow

Poeciliidae - livebearers {2}
Gambusia affinis (Baird and Girard, 1853) - western mosquitofish
Heterandria formosa Agassiz, 1855 - least killifish [Introduced?]

Moronidae - temperate basses {1}
Morone mississippiensis Jordan and Evermann, 1887 - yellow bass

Centrarchidae - sunfishes {13}
Centrarchus macropterus (Lacépède, 1801) - flier
Lepomis cyanellus Rafinesque, 1819 - green sunfish
Lepomis gulosus (Cuvier, 1829) – warmouth
Lepomis humilis (Girard, 1858) - orangespotted sunfish
Lepomis macrochirus Rafinesque, 1819 – bluegill
Lepomis marginatus (Holbrook, 1855) - dollar sunfish
Lepomis megalotis (Rafinesque, 1820) - longear sunfish
Lepomis microlophus (Gunther, 1859) - redear sunfish
Lepomis miniatus Jordan, 1877 - redspotted sunfish
Lepomis symmetricus Forbes, 1883 - bantam sunfish
Micropterus salmoides (Lacépède, 1802) - largemouth bass
Micropterus punctulatus (Rafinesque, 1819) - spotted bass
Pomoxis annularis Rafinesque, 1818 - white crappie
Pomoxis nigromaculatus (Lesueur, 1829) - black crappie

Percidae - perches {9}
Ammocrypta vivax Hay, 1882 - scaly sand darter
Etheostoma chlorosomum (Hay, 1880) - bluntnose darter
Etheostoma collettei Birdsong and Knapp, 1969 - creole darter

Etheostoma gracile (Girard, 1859) - slough darter
Etheostoma histrio Jordan and Gilbert, 1887 - harlequin darter
Etheostoma proeliare (Hay, 1880) - cypress darter
Percina macrolepida Stevenson, 1971 - bigscale logperch
Percina maculata (Girard, 1859) - blackside darter
Percina sciera (Swain, 1883) - dusky darter

Sciaenidae - drums and croakers {1}
Aplodinotus grunniens Rafinesque – Freshwater drum

Elassomatidae - pygmy sunfish {1}
Elassoma zonatum Jordan, 1877 - banded pygmy sunfish

Nomenclature and phylogenetic order follows Nelson, *et al*. 2004. Common and Scientific Names of Fishes from the United States, Canada, and Mexico, 6th Edition. American Fisheries Society Special Publication 29. 386 pp. Exceptions are noted.

Genetics:

Genetic analysis was conducted on largemouth bass liver tissue samples collected on Bundick Lake during the 1988, 2003, 2006, 2008, and 2009 fall electrofishing samples. Allozyme starch gel electrophoresis analyses were conducted at the Louisiana State University School of Renewable Natural Resources genetics laboratory.

Table 7. Genetic testing of largemouth bass in Bundick Lake from 1988, 2003, 2006, 2008, and 2009

Year	Number	Northern	Florida	Hybrid	Florida Influence
1988	30	94.4%	0%	6.6%	6.6%
2003	31	81%	0%	19%	19%
2006	41	90%	0%	10%	10%
2008	50	88%	2%	10%	12%
2009	53	81%	0%	19%	19%

Threatened/endangered/exotic species:
Bald eagles have been known to nest annually since 2004 along the north central shoreline of Bundick Lake.

Figure 1. Photograph of bald eagle taken on Bundick Lake courtesy Bobby Reed, LDWF.

CREEL

Historic Information/Type:
Recreational angler surveys were conducted for 12-month period during 2002 to determine angler effort and catch rates. Roving surveys to count anglers were made at random during each scheduled interview period to allow expansion of data to estimate total angler attributes. Creel survey results are discussed in Part B of the management plan.

WATER USE

Hunting:
Waterfowl hunting is permitted during the legal open season.

Water Skiing:
Because of the many stumps in Bundick Reservoir, almost no water sports activities occur on the lake.

Swimming:
There are no public swimming areas on Bundick Lake. Where it does occur, it is swim at

your own risk with no life guards on duty.

Fishing & boat riding:
Yes

Swamp Tours:
N/A

Irrigation:
There are no agricultural or municipal water withdrawals for the purpose of irrigation. Several private property owners have personal irrigation systems designed for yard and garden watering only.

APPENDIX I

LAKE MAP W/BOAT LAUNCHES AND PIERS

(Click here to return)

Ramp Name – clockwise from lower center	Coordinates	Ramp	Parking
Spillway Park	**30°43'36.64" N -93°05'43.76" W**	concrete	Dirt, 25 trailers
Clark's Landing	**30°44'26.95" N -93°06' 35.25" W**	gravel	Dirt, 5 trailers
Hopewell Bridge	**30°45'56.52" N -93°07'26.44" W**	concrete	Gravel 10 trailers
Ray Coonce Landing	**30°44'42.73" N -93°05' 35.29" W**	concrete	Asphalt, 5 trailers

APPENDIX II

(return to previous page)

VEGETATIVE TYPE MAP NARRATIVES

BUNDICK LAKE
September 2007
Eric Shanks

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on September 25, 2007. On the day of the survey the water was relatively clear with secchi disk reading of 65 cm. Water levels in the lake were at pool stage (95' MSL).

The heaviest infestation of aquatic vegetation was alligatorweed (*Alternanthera philoxeroides*). This plant was observed in light amounts along most of the shoreline with heavy infestations in shallow coves, especially on the north end of the lake.

Floating plants observed included common salvinia (*Salvinia minima*) and water hyacinth (*Eichhornia crassipes*) present in light to heavy amounts in some coves and on the north end of the lake.

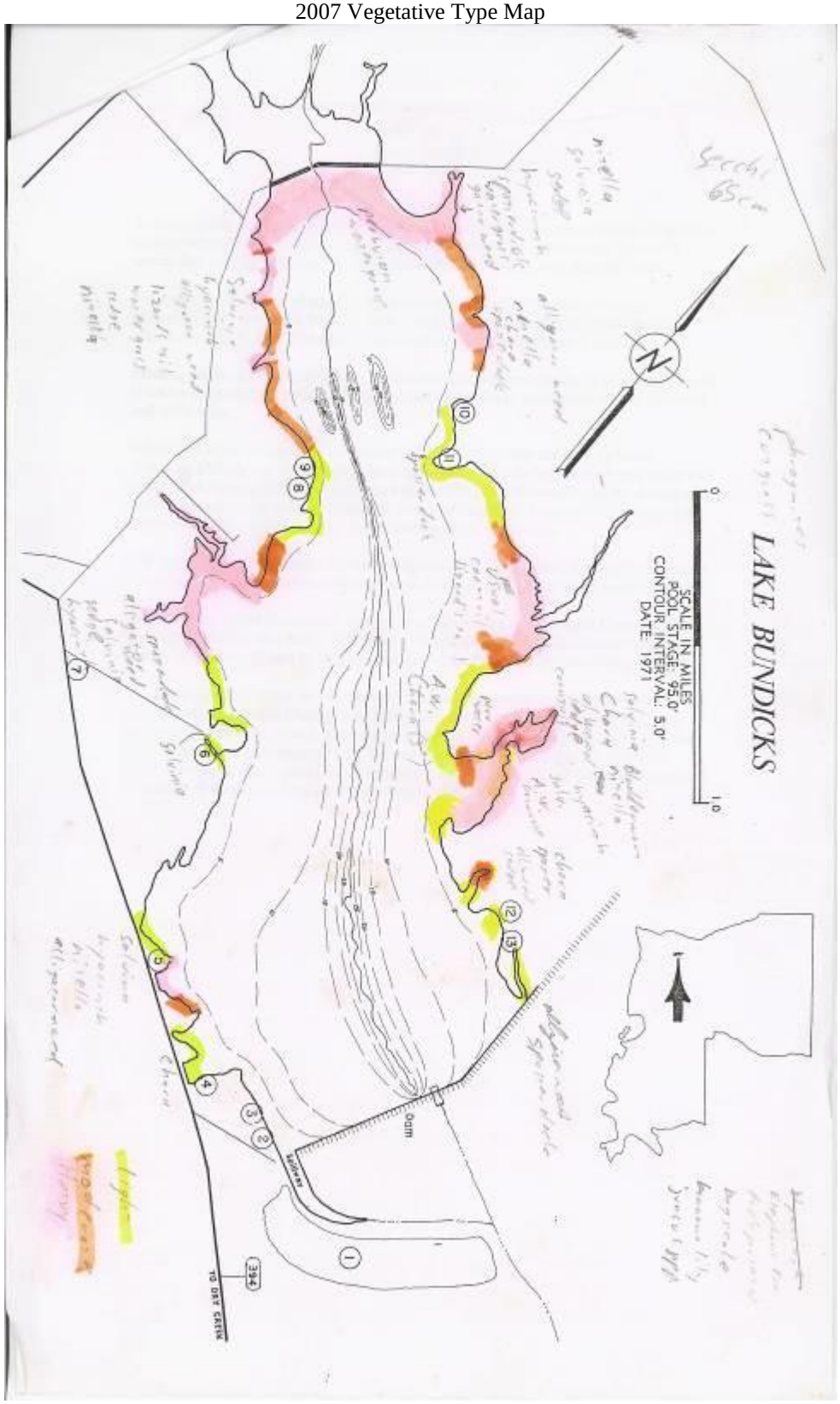
Submersed aquatic plants that were observed on the Bundick Lake survey in light to heavy amounts included stonewort (*Nitella spp.*) and muskgrass (*Chara spp.*). These plants were found in the two to four foot contour with some heavy infestations in the shallow coves on the northern and eastern end of the lake. Moderate to heavy infestations of coontail (*Ceratophyllum demersum*) were present in coves on the eastern shore of the lake.

Spatterdock (*Nuphar luteum*) and water sedge (*Cyperus spp.*) were observed along much of the shoreline, and moderate amounts were found in most of the coves around the lake.

Peruvian water grass (*Luziola peruviana*) was still present in the Baptist Cove along the east side of the lake in a heavy infestation. Of particular note, light amounts were also observed on the north end of the lake, present for the first time outside of Baptist cove.

Other plants observed in trace to light amounts were maidencane (*Panicum hemitomon*), smartweed (*Polygonum hydropiperoides*), duck potato (*Sagittaria spp.*), bagscale (*Sacciolepis striata*), giant cutgrass (*Zizaniopsis miliacea*), elephant ear (*Taro spp.*), lizard's tail (*Saururus cernus*), banana lily (*Nymphoides aquatica*), spikerush (*Eliocharis spp.*), water grass (*Luziola fluitans*), and common reed (*Phragmites australis*) with most of these occurring on the north end of the lake.

2007 Vegetative Type Map



BUNDICK LAKE
September 2008
Eric Shanks

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on September 30, 2008. On the day of the survey water clarity was 46cm as measured by secchi disk. Water levels in the lake were at pool stage (95' MSL).

The heaviest infestations of aquatic vegetation were alligatorweed (*Alternanthera philoxeroides*) and spatterdock (*Nuphar luteum*). Spatterdock was present in light amounts around most of the lake with moderate to heavy amounts on the western and northern parts of the lake. While heavy infestations of alligatorweed were present in these same areas, the amounts were much reduced from last year, with spatterdock appearing to replace much of it.

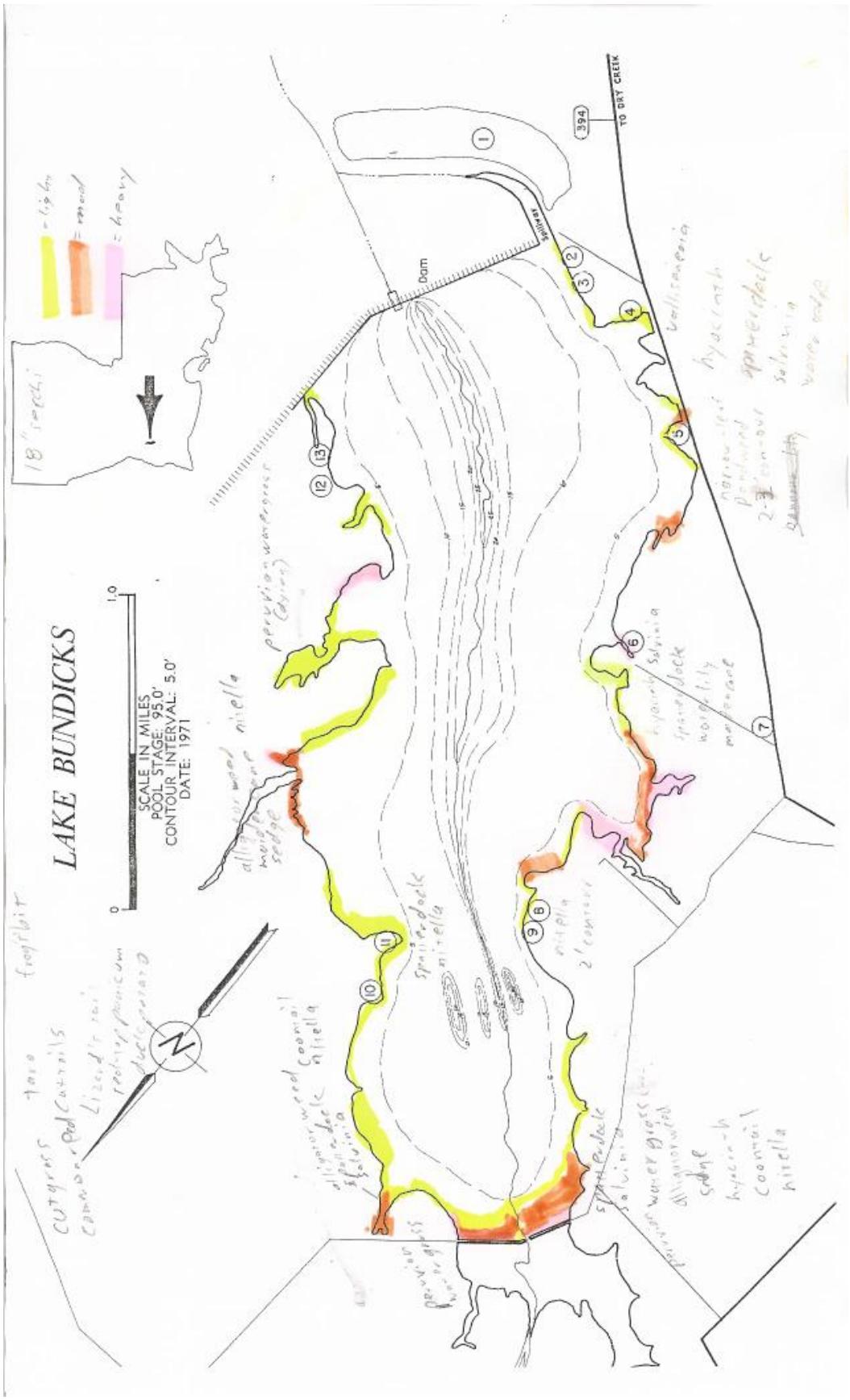
Floating plants observed included common salvinia (*Salvinia minima*) and water hyacinth (*Eichhornia crassipes*) present in light to moderate amounts in some coves and on the north end of the lake, with lesser infestations than last year.

Stonewort (*Nitella spp.*) was the predominant submersed aquatic plant that was observed in light to moderate amounts in the 2' to 3' contour and some shallow coves on the eastern side of the lake. Light to moderate infestations of coontail (*Ceratophyllum demersum*) were present in the northern part of the lake.

Efforts to control Peruvian water grass (*Luziola peruviana*) appeared to be successful this year as only light amounts were present in the Baptist Cove, a drastic reduction from last year. Trace amounts were also observed on the north end of the lake.

Other plants observed in trace to light amounts were maidencane (*Panicum hemitomon*), water sedge (*Cyperus spp.*), cattail (*Typha spp*.), red-top panicum (*Panicum rididulum*), smartweed (*Polygonum hydropiperoides*), duck potato (*Sagittaria spp.*), giant cutgrass (*Zizaniopsis miliacea*), elephant ear (*Taro spp*.), lizard's tail (*Saururus cernus*), American water lily (*Nymphaea odorata*), spikerush (*Eliocharis spp*.), water grass (*Luziola fluitans*), frog's bit (*Limnobium spongia*), and common reed (*Phragmites australis*) with most of these occurring on the north end of the lake.

Vegetative Type Map 2008



BUNDICK LAKE
September 2009
Eric Shanks

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on September 17, 2009. On the day of the survey water clarity was 51cm as measured by secchi disk. Water levels in the lake were at pool stage (95' MSL).

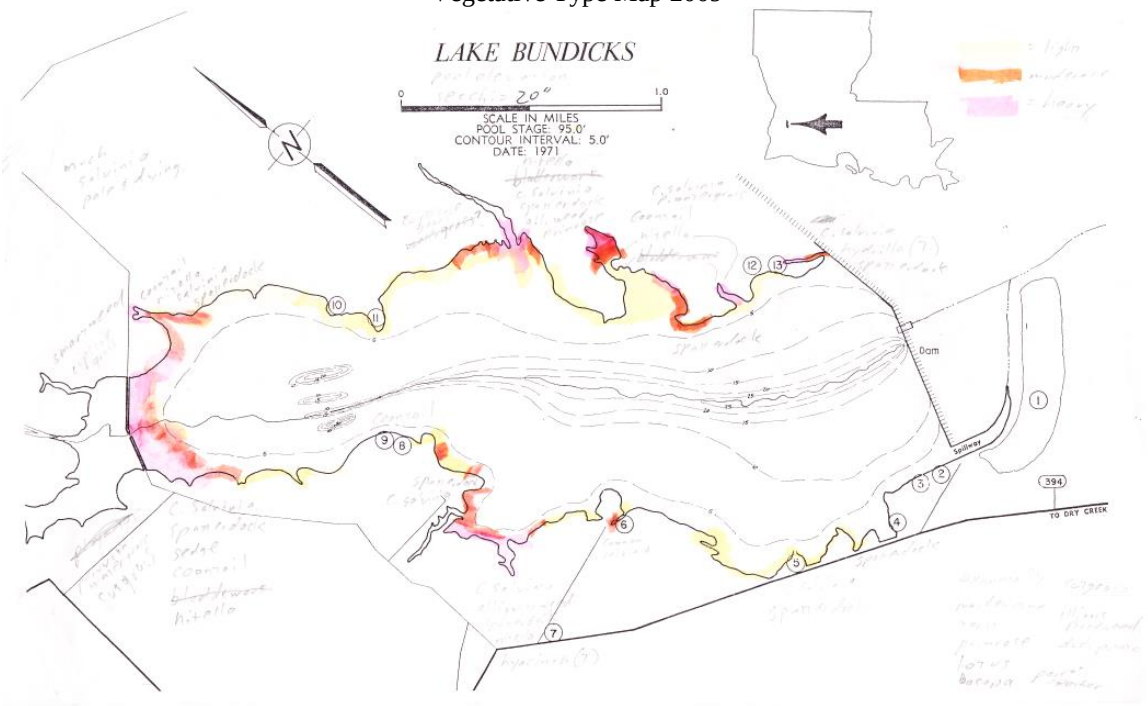
The most common aquatic vegetation observed were common salvinia (*Salvinia minima*) and spatterdock (*Nuphar luteum*). Heavy infestations of salvinia occurred on the north end of the lake with light to moderate infestations on the western shoreline. Much of the salvinia in the Hopewell bridge area appeared to be dying from district spray efforts. Spatterdock was present in light amounts around most of the lake with moderate to heavy amounts on the northern part of the lake.

Stonewort (*Nitella spp.*) and coontail (*Ceratophyllum demersum*) were the predominant submersed aquatic plants observed. Stonewort was present in light to moderate amounts in the 2' to 3' contour with some heavy accumulations on the northern and eastern shores of the lake. Light to moderate amounts of coontail were present along the 2' to 5' contour except for the southwestern quarter of the lake.

Emersed plants alligatorweed (*Alternanthera philoxeroides*) and American cupscale grass (*Sacciolepis striata*) were present in light amounts with one heavy infestation of each on opposite shores of the lake and some heavy infestations of cupscale grass in the northern section. Efforts to control Peruvian water grass (*Luziola peruviana*) and alligatorweed continued to be successful as we observed continuing reductions of both from last year.

Other plants observed in trace to light aggregations were maidencane (*Panicum hemitomon*), water sedge (*Cyperus spp.*), smartweed (*Polygonum hydropiperoides*), duck potato (*Sagittaria spp.*), giant cutgrass (*Zizaniopsis miliacea*), southern cutgrass (*Leersia spp.*), elephant ear (*Taro spp.*), primrose (*Ludwigia spp.*), American lotus (*Nelumbo lutea*), bacopa (*Bacopa spp.*), Illinois pondweed (*Potamogeton illinoensis*), parrot feather (*Myriophyllum aquaticum*), hydrilla (*Hydrilla verticillata*), banana lily (*Nymphoides aquatica*), and water hyacinth (*Eichhornia crassipes*), with most of these occurring on the northern half of the lake.

Vegetative Type Map 2009



BUNDICK LAKE
September 2010
George Melancon

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on September 19, 2010. On the day of the survey water clarity was 69cm as measured by secchi disk. Water levels in the lake were at pool stage (95' MSL).

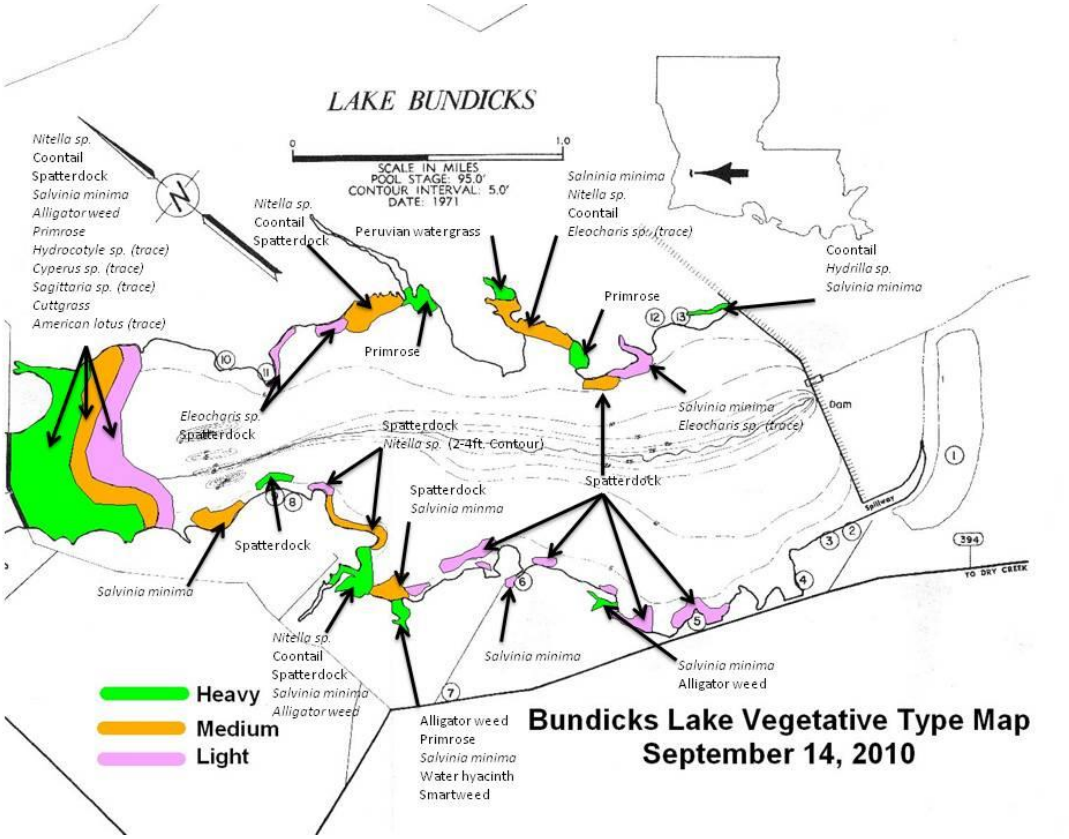
Areas of observed occurrence were designated as "Heavy", "Medium", or "Light". The most common aquatic vegetations observed were primrose (*Ludwigia spp.)*, common salvinia (*Salvinia minima*), and spatterdock (*Nuphar luteum*). Heavy infestations of aquatic vegetation occurred on the north end of the lake and several bays and covers around the perimeter. Predominant species associated with these areas were common salvinia, spatterdock, alligatorweed (*Alternanthera philoxeroides*), and coontail (*Ceratophyllum demersum*).

A heavy infestation of aquatic vegetation was observed in a small canal near the north end of the dam. This area contained moderate amounts of coontail, common salvinia, duckweed (*Lemna. sp.*), and hydrilla (*Hydrilla verticillata*). The hydrilla appears to be confined to this small area, far it was observed in no other location.

Submerged aquatic vegetation (SAV) most commonly observed were stonewort (*Nitella spp.*) and coontail (*Ceratophyllum demersum*). Occurrences were generally regarded as medium to light at the 2-4ft contours. Spikerush *(Eliocharis spp.)* was also found in light to trace amounts in several locations around the lake.

Other species of aquatic plants found in light to trace amounts include water pennywort (*Hydrocotyle spp.)*, giant cutgrass (*Zizaniopsis miliacea*), American lotus (*Nelumbo lutea*), duck potato (*Sagittaria spp.*), water sedge (*Cyperus spp.*), and smartweed (*Polygonum hydropiperoides*).

Peruvian water grass (*Luziola peruviana*) continues to be found in high concentrations near the Baptist Cove area; however the spray efforts by District 5 spray crew have reduced the affected area to only about 10 acres or less. Efforts will continue to treat this area to prevent expansion.



BUNDICK LAKE
October 2011
George Melancon

Bundick Lake, in Beauregard Parish, was surveyed for the presence of aquatic vegetation on October 26, 2011. On the day of the survey water clarity was 12cm as measured by secchi disk which is significantly lower than past years. Water levels in the lake were well below pool stage due to prolonged drought conditions. This limited our access to some areas of the lake.

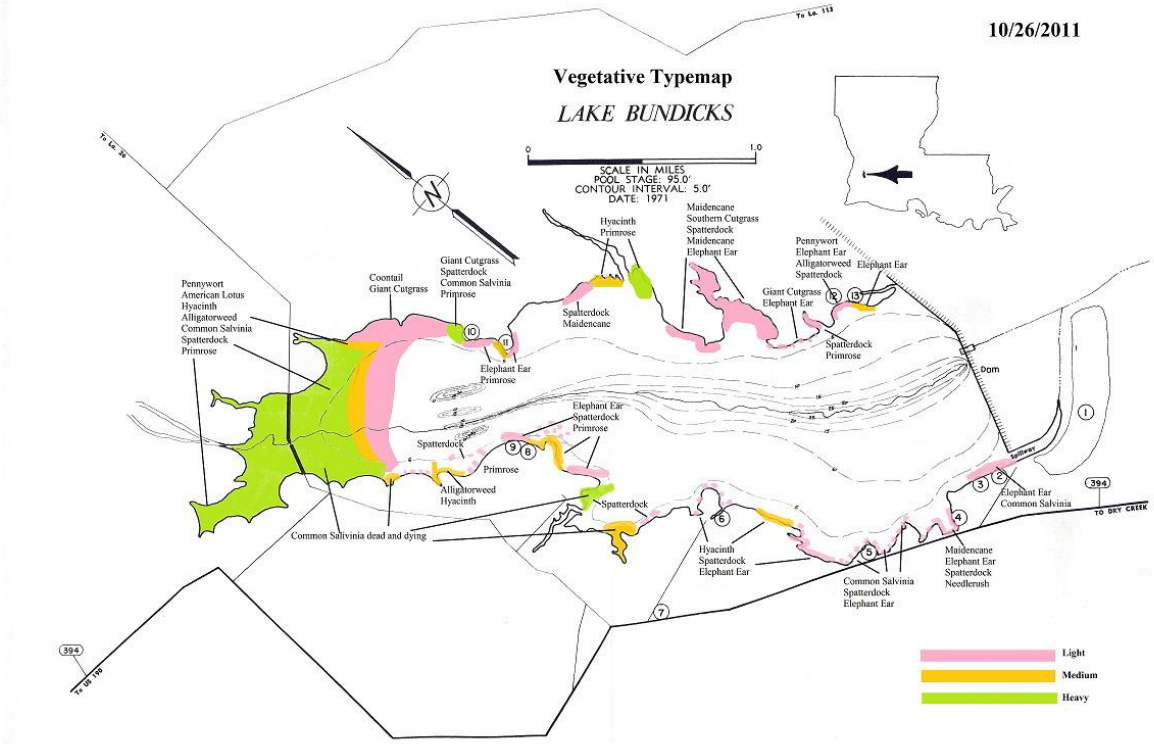
Areas of observed occurrence were designated as "Heavy", "Medium", or "Light". The most common aquatic vegetations observed were primrose (*Ludwigia spp.),* common salvinia (*Salvinia minima*), and spatterdock (*Nuphar luteum*). Heavy infestations of aquatic vegetation occurred on the north end of the lake and several bays and covers around the perimeter. Predominant species associated with these areas were common salvinia, spatterdock, and alligatorweed (*Alternanthera philoxeroides*).

Very little submerged aquatic vegetation (SAV) was observed possibly due to the reduced water clarity.

Other species of aquatic plants found in light to trace amounts include water pennywort (*Hydrocotyle sp.),* giant cutgrass (*Zizaniopsis miliacea*), American lotus (*Nelumbo lutea*), duck potato (*Sagittaria spp.*), water sedge (*Cyperus spp.*), and smartweed (*Polygonum hydropiperoides*).

District 5 spray crews have successfully accomplished control of Peruvian water grass (*Luziola peruviana*) in the Baptist Cover area with the aid of the new surface drive spray rigs. Very little was observed in this area during the survey.

This year spray crews began targeting the heavy infestations of aquatic vegetation located in the shallow flats on the north side of the lake. Historically these areas have been a chronic problem due to limited access with the traditional equipment. However due to the low water levels access has remained limited. Once water levels return to normal the surface drive equipment will allow spray crews to access these areas and increase control.


10/26/2011
Vegetative Typemap
LAKE BUNDICKS
SCALE IN MILES
POOL STAGE: 95.0'
CONTOUR INTERVAL: 5.0'
DATE: 1971
Pennywort
American Lotus
Hyacinth
Alligatorweed
Common Salvinia
Spatterdock
Primrose
Coontail
Giant Cutgrass
Giant Cutgrass
Spatterdock
Common Salvinia
Primrose
Elephant Ear
Primrose
Hyacinth
Primrose
Spalterdock
Maidencane
Maidencane
Southern Cutgrass
Spatterdock
Maidencane
Elephant Ear
Pennywort
Elephant Ear
Alligatorweed
Spatterdock
Elephant Ear
Giant Cutgrass
Elephant Ear
Spatterdock
Primrose
Dam
Elephant Ear
Spatterdock
Primrose
Spatterdock
Primrose
Alligatorweed
Hyacinth
Spatterdock
Common Salvinia dead and dying
Elephant Ear
Common Salvinia
TO DEY CREEK
Hyacinth
Spatterdock
Elephant Ear
Common Salvinia
Spatterdock
Elephant Ear
Maidencane
Elephant Ear
Spatterdock
Needlerush
Light
Medium
Heavy

APPENDIX III

Bundick Lake Flood Analysis Correspondence 1962-1983

STATE OF LOUISIANA

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

INTRADEPARTMENTAL CORRESPONDENCE

P. O. Box 1399
Lake Charles, Louisiana 70602
(318) 439-2406

IN REPLY PLEASE REFER TO FILE NO.

January 4, 1983

REFERRED TO

_____

_____

_____

_____

____ REFERRED FOR ACTION
____ ANSWER FOR MY SIGNATURE
____ FOR FILE
____ FOR YOUR INFORMATION
____ FOR SIGNATURE
____ RETURN TO ME
____ PLEASE SEE ME
____ PLEASE TELEPHONE ME
____ FOR APPROVAL
____ PLEASE ADVISE ME

____ / _____

BY _____ DATE _____
BY _____ DATE _____
BY _____ DATE _____
BY _____ DATE _____

Mr. Richard Bennett
Programs Administrator
Federal and State Programs
DOTD, Office of Public Works
P. O. Box 44155, Capitol Station
Baton Rouge, Louisiana 70804

Re: Bundicks Lake Flooding
Beauregard Parish

Dear Mr. Bennett:

Reference is made to your recent inquiry pertaining to the above subject.

Research of our files, the courthouse records in DeRidder, and discussions with former Bundicks Lake Commission members reveal that only R/W grants were obtained to elevation 95.0 ft. MSL in the lake area. Apparently information of grants obtained to the elevation of 105.0 ft. MSL as reported in 1978 was erroneous information received from the Police Jury.

Please find attached for your information several pieces of correspondence, newspaper clippings, and designs which will give you a history of what has transpired in the past on Bundicks Lake flooding.

Should additional information be required, please advise me.

Sincerely yours,

OLIVIER BROUSSARD III, P.E.
DISTRICT ADMINISTRATOR

B. J. LANDRY
DISTRICT PUBLIC WORKS ENGINEER

BJL/caa
Attachment as noted.
cc: Gang 001
Gang 357✓
Mr. Arthur Theis

RDR

RECOMMENDED FOR APPROVAL _____ DATE _____

RECOMMENDED FOR APPROVAL _____ DATE _____

RECOMMENDED FOR APPROVAL _____ DATE _____

STATE OF LOUISIANA
HOUSE OF REPRESENTATIVES
BATON ROUGE

JAMES DAVID CAIN
DISTRICT 32

March 19, 1973

Phone Office 328-6460
Phone Home 328-6460
BOX 427
DRY CREEK, LA. 70637

COMMITTEES:
AGRICULTURE
TRANSPORTATION & HIGHWAYS
JUDICIARY C
INTERIM COMMITTEES:
CORRECTIONAL INSTITUTIONS
EDUCATION

RECEIVED
MAR 20 1973
DEPARTMENT OF PUBLIC WORKS
BATON ROUGE, LA.

Roy Aguillard, Director
Department of Public Works
P. O. Box 44155, Capitol Station
Baton Rouge, Louisiana 70804

Dear Mr. Aguillard:

To confirm the conversation we had in your office, Friday, March 16, I want to request formally by this letter the improvement plan for the management of Bundicks Lake, Beauregard Parish, as proposed by the Louisiana Wild Life and Fisheries Commission.

As you know by the study of your department, the Wild Life and Fisheries Commission had four recommendations or priorties. I want to formally confirm our conversation where you stated priorty No. 1 would be done in the next year 1974.

We want to include at least one priorty each year there after.

Of course, as you know, I would like to have all four done at once but realizing your budget and the cost of this project, I understand your reluctance to approve them all at one time.

Please confirm this correspondence so I can report to my Parish Police Jury and the Bundicks Lake Commission your plan to carry out the recommendations. stated in a letter to me from your department dated February 19, 1973.

Sincerely,

James David Cain

James David Cain
Representative

STATE OF LOUISIANA
DEPARTMENT OF PUBLIC WORKS
P. O. BOX 44155, CAPITOL STATION
BATON ROUGE, LA. 70804

ROY AGUILLARD
DIRECTOR

February 19, 1973

Beauregard Parish Police Jury
Post Office Box 310
DeRidder, Louisiana 70634

Gentlemen:

In response to requests made by the Chairman of the Bundicks Game & Fish Commission, Representative James D. Cain, and the Beauregard Parish Police Jury, the Department of Public Works has reviewed the preliminary improvement plan for management of Bundicks Lake as proposed by the Louisiana Wild Life & Fisheries Commission in their report of November 30, 1972. We have prepared basic engineering information with cost estimates relative to this management program.

We will first make a summary statement with cost information in relation to the four recommendations contained in the Wild Life & Fisheries Commission report. Recommendation No. 1 suggested that certain areas in the lake be cleared of standing and fallen timber. Using the map provided by the report, it has been estimated that the acreage involved is 800 acres and the cost of clearing this amount by contract would be $300,000.

Recommendation No. 2 is related to the emergency spillway. The proposed lowering of the emergency spillway five feet to elevation 98.0 would result in a stage lowering of only one foot for a storm similar to that of November, 1966. Due to the type material in this emergency spillway, lowering would not be feasible and the cost of stabilizing or construction of a permanent type spillway necessary would be excessively expensive for the benefits obtained.

Recommendation No. 3 relates to the capacity of the present control structure. Construction of an additional spillway of capacity needed to prevent flooding of existing buildings would cost approximately $1,000,000.

Recommendation No. 4 is giving consideration to raising the pool stage, which could only result in additional flood hazards.

Bundicks Lake Reservoir was completed in November 1962 at a cost of approximately $952,000. The principal spillway is of concrete 200 feet in length with a crest elevation of 95.0 feet mean sea level. The emergency spillway is of undisturbed earth 500 feet in length at elevation 103.0 feet mean sea level. The drainage area contributing to the reservoir is 208 square miles. There is a five foot by five foot drawdown structure for draining the lake during periods of no rainfall for management purposes.

Shortly after the lake was put into operation, it was brought to our attention that an increasing number of camps were being constructed along the perimeter of Bundicks Creek Lake at floor elevations which were not sufficiently high to avoid flooding during surcharges of the lake level. The attached letter of April 17, 1962 was sent to the Bundicks Game & Fish Commission and it is our understanding it was published in the DeRidder newspaper. Hydraulic studies were made prior to construction of this reservoir and additional studies made over the past years and these studies have shown that the reservoir stage can be expected to surcharge to elevation 103.0 feet on an average of once in 20 years. Floods of the magnitude of the one which occurred in early November, 1966 surcharged the lake stage to elevation 100.5 feet and can be expected on an average of once in about 10 years. The maximum rainstorm of record over the entire watershed would raise the lake to elevation 107.0 feet.

The operation of the gate in the five foot by five foot drawdown structure will have no measurable effect on surcharge stages in the lake resulting from medium and major rainstorms. For example, when the lake is at elevation 100.0, the rate of flow spilling over the concrete spillway is in excess of 20 times the rate that would flow through the drawdown structure. At a stage of 103.0 feet, this rate over the spillway would increase by 35 times that through the drawdown structure.

Referring to Recommendation No. 1 of the lake management plan, we have made a breakdown of costs for clearing the lake in the order of priority set by the Wild Life & Fisheries Commission's report. This is as follows:

Priority No. 1	-	265 acres	- $99,375.00
Priority No. 2	-	195 acres	- 73,125.00
Priority No. 3	-	245 acres	- 91,875.00
Priority No. 4	-	95 acres	- 35,625.00

Clearing and burning of the timber in the lake as recommended will be rather expensive due to the hazards and difficulties of burning that will be involved. The total cost as stated for performing and completing the clearing specified is $300,000. Attached is a map from the management report showing the location of the priority areas.

In reference to Recommendation No. 2, we could not recommend the lowering of the emergency spillway to 98 feet mean sea level. A study by our Hydraulics Section shows that very little benefit would result from this proposal. The reduction in major flood heights

would be minimal and the lowering of the emergency spillway would result in storm runoff spilling over it once every year or two resulting in its deterioration and destruction. The material in this spillway is very erodible and would become washed full of gullies from the first few floods. Providing a permanent type structure at this location would be too expensive for the benefits achieved. Degrading of the emergency spillway is not recommended.

Recommendation No. 3 does not relate to the management of aquatic weed control. It only relates to surcharge elevations obtained under various storm conditions. The construction of 300 feet of additional spillway at elevation 95.0 feet, giving a total length of 500 feet for the lake spillway, would result in lowering the surcharge stage in the lake only two feet for a recurrence of the flood of November, 1966. Thus, the stage would have been 98.5 feet instead of 100.5 feet that occurred. A flood of 20 year recurring probability would surcharge the lake to elevate 100.0 feet or slightly higher with the 500 foot spillway in place. A solution which would provide better control of flood surcharge heights would be to construct an additional spillway equipped with radial gates. The gates would be opened to pass floods th rough at reduced surcharge stages. This has an additional advantage in that the lake could be partially emptied before a major flood. A spillway so equipped with an aggregate length of 80 feet with crest elevation of 83 feet would result in an expected surcharge stage of 97.5 feet for a flood that will surcharge to 101.5 feet under existing conditions. The estimated cost for this additional spillway is $1,000,000. Attached is a sketch showing the type structure considered.

As stated above, Recommendation No. 4 could result in increased flood hazards to the existing buildings and roads around the perimeter of Bundicks Creek Lake. Costs of any plan which would be considered for this proposal would be very expensive.

Although not included in the Wild Life & Fisheries Commission management plan, we have prepared a cost estimate for installation of an additional drawdown structure if it were considered desirable to lower the lake during dry or no rain periods at a faster rate than is now possible. The estimated cost for such an additional drawdown structure of similar dimensions to the present one is $205,000. We are not recommending this additional structure but are only providing it for your information since the data is available.

I hope that the information provided will satisfy your needs. If more detailed data or explanation of any of the hydraulic or cost estimate information is required, we will be happy to meet with you and answer your questions.

Very truly yours,

Roy Aguillard

ROY AGUILLARD
DIRECTOR

DVC:dz
Attachments

cc: Honorable Bryan A. Poston
Honorable James D. Cain
Mr. G. M. McGregor, Chairman
Bundicks Game & Fish Commission

STATE OF LOUISIANA
DEPARTMENT OF PUBLIC WORKS
BATON ROUGE

LEON GARY
DIRECTOR

May 4, 1966

Mr. J. E. Haggar, Manager
DeRidder Chamber of Commerce
P. O. Box 309
DeRidder, Louisiana

Dear Mr. Haggar:

Reference is made to your letter of April 22, 1966 requesting pertinent data and information on Bundicks Lake. The following is a tabulation of pertinent data:

Drainage Area	= 208 sq. mi.
Pool Stage	= 95.0 above mean sea level (MSL)
Lake Area	= 1750 acres
Lake Volume	= 9200 Ac.-Ft.
Lake Depth at Dam	= 12.0 ft.
Average Depth of Lake	= 5.2 ft.
Length of Shoreline	14 mi.
Length of Main Spillway (Concrete)	= 200 ft.
Length of Secondary Spillway (Turfed)	= 500 ft.
Elevation of Secondary Spillway	= 103.0 (MSL)

The gated drawdown structure is one 5 ft. x 5 ft. x 262 ft. reinforced concrete box conduit with a lift gate on the lake end.

This gated structure was designed to lower the lake stage during periods of low inflow to the lake. During periods of extreme low flow the lake can be emptied in a period of about two weeks. The operation of this structure would not make any measurable difference on the heights of water in the lake during medium and major rain storms. With an empty lake it would fill and be spilling over the main spillway several days before the peak flow of most medium to major floods into the lake. With a surcharge of the lake's stage to elevation 100.0 msl or 5.0 feet above the spillway crest the rate of spilling would be in excess of 20 times the rate that would flow through the drawdown structure with the gate open. For a surcharge of 8.0 feet or just when the secondary spillway would go into use, this rate would have increased to 35 times that through the drawdown structure.

Hydrologic and hydraulics computations show that on an average of once in about ten years rain storms on the lake's watershed will cause the lake level to surcharge to elevation 100.0 msl. On an average of once in about 20 years the lake level can be expected to surcharge to elevation 103.0. The maximum rain storm of record over the entire watershed would raise the lake level to elevation 107.0.

On the basis of the daily stream flow since January, 1939, of Bundicks Creek near Dry Creek, with a drainage area of 238 square miles, the discharge into the lake area has ranged from about 40 cubic feet per second (cfs) to about 35,000 cfs with an average daily discharge of some 360 cfs or 263,000 acre-feet* per year.

Under existing uses of the lake, water will spill continuously over the main spillway except, of course, when the drawdown gate is open. Continuous withdrawals from the lake of amounts up to 15,000,000 gallons per day could be made without lowering the lake's stage below the crest elevation of the main spillway.

If additional data and information are needed, please feel free to call on us.

Sincerely,

CALVIN T. WATTS
Assistant Director

CTW:lk

cc: Mr. J. B. LeDoux

*An acre-foot is the quantity of water required to inundate an acre in area to a depth of one foot. (43,560 cubic feet or 326,000 gallons)

STATE OF LOUISIANA
DEPARTMENT OF PUBLIC WORKS
BATON ROUGE

LEON GARY
DIRECTOR

November 29, 1966

MEMORANDUM

TO: Mr. Hu B. Myers, Chief Engineer

FROM: C. K. Oakes, Chief Hydraulics Section CKO

SUBJECT: Bundick Creek Reservoir Flooding

In accordance with your instructions a study has been made of the hydrologic aspects of Bundick Creek Reservoir relative to lowering surcharge stages resulting from major floods.

The principal spillway is of concrete 200 feet in length with a crest elevation at 95.0 m.s.l. The emergency spillway is of undisturbed earth 500 feet in length at elevation 103.0 The drainage area contributing to the reservoir is 208 square miles.

On the basis of daily stream flow records of Bundick Creek, since January 1939, some 5 or 6 miles downstream of the dam with a drainage area of 238 square miles, on an average of once in about 20 years floods can be expected that will surcharge the reservoir stage to elevation 103.0 Floods of the magnitude of the one which occurred in early November of this year, which surcharged the stage to elevation 100.5, can be expected on an average of once in about 10 years.

The operation of the gate in the 5 ft. x 5 ft. drawdown structure will have no measurable effect on surcharge stages resulting from floods. For example when the lake level is at elevation 100.0 the rate of flow spilling over the spillway is in excess of 20 times the rate that would flow through the drawdown structure. At a stage of 103.0 this rate would increase to 35 times that through the drawdown structure.

There have been frequent reports of homes and camps being flooded by pool stages of 100.0 and less. Local interests have indicated a desire to lower or degrade the emergency spillway as a solution to the flooding. Hydraulics computations show that lowering the emergency spillway 4.0 feet to elevation 99.0 would only effect a reduction in stage of about 0.5 of a foot to elevation 100.0 for the flood of November, 1966. Degrading it 5.0 feet or to elevation 98.0 would result in a stage lowering of only 1.0 foot or to elevation 99.5 for the same flood.

MEMORANDUM

TO: MR. Hu B. Myers, Chief Engineer
FROM: Mr. C. K. Oakes, Chief Hydraulics Section

November 22, 1966

An emergency spillway at elevation 98.0 would result in floods spilling over it once every year or two and twice during some years. The material in this spillway is very erodable and would become washed full of gullies from the first few floods. Degrading the emergency spillway is not recommended.

The construction of 300 feet of additional spillway at elevation 95.0 giving a total length of 500 feet, would result in lowering the surcharge stage only 2.0 feet for a recurrence of the recent flood. Thus the stage would have been 98.5 instead of the 100.5 that occurred. A flood of 20 year recurring probability would surcharge the lake to elevation 100.0 or slightly higher with the 500-foot spillway.

One other solution is to construct an additional spillway at a lower elevation equipped with radial gates. The gates would be opened to pass floods through at reduced surcharge stages. This has an additional advantage in that the lake could be partly emptied before a major flood. A spillway so equipped with an aggregate length of 80 feet at a crest elevation of 83.0 would result in a peak surcharge stage of 97.5 for a flood that will surcharge to 101.5 under existing conditions.

An additional spillway 80 feet in length at crest elevation 83.0 equipped with radial gates is recommended.

/jr

November 29, 1966

Senator Jesse M. Knowles
636 West LaGrange
Lake Charles, Louisiana

Dear Senator Knowles:

In accordance with your request, a study has been made of the hydrologic aspects of Bundicks Creek Reservoir relative to lowering surcharge stages resulting from major rain storms.

The principal spillway is concrete, 200 feet in length, with a crest elevation at 95.0' m.s.l. The emergency spillway is of undisturbed earth, 500 feet in length at elevation 103.0' m.s.l. The drainage area contributing to the reservoir is 208 square miles.

On the basis of daily stream flow records of Bundicks Creek since January, 1939, floods that will surcharge the reservoir stage to elevation 103.0 can be expected on an average of once in 20 years. Floods of the magnitude of the one which occurred in early November of this year, which surcharged the lake stage to elevation 100.5, can be expected on an average of once in about 10 years. The maximum rain storm of record on the entire watershed would raise the lake to elevation 107.0.

The operation of the gate in the 5 ft. x 5 ft. drawdown structure will have no measurable effect on surcharge stages in the lake resulting from medium and major rain storms. For example, when the lake level is at elevation 100.0 the rate of flow spilling over the concrete spillway is in excess of 20 times the rate that would flow through the drawdown structure. At a stage of 103.0 this rate over the spillway would increase to 33 times that through the drawdown structure.

A field reconnaissance of the Bundicks Lake area was made by our District Engineer, Mr. George Johns, on November 16, 1966, to determine the effects of the rain of November 11 and 12, 1966. The amount of rainfall within the lake watershed varied from 6 to 11 inches, causing the lake level to rise rapidly from the pool stage of 95.0 feet m.s.l. to a high of 100.5 feet. Approximately sixty (60) camps within the marginal area around the lake perimeter, having floor elevations less than 100.5 feet m.s.l. experienced moderate to heavy damages from the rising waters. Also, quite a few wharves were damaged from floating debris.

The general trend of thought of the local camp owners was that lowering of the emergency spillway four (4) feet to elevation 99.0 would afford relief to the area for future rains of similar magnitude. A study by our Hydraulic Section shows that very little benefit would result from this proposal. Lowering the emergency spillway four (4) feet to elevation 99.0 would only effect a reduction in stage of

about 0.5 of a foot or to elevation 100.0 for the rain storm of November 11 and 12, 1966. Lowering the emergency spillway five (5) feet or to elevation 98.0 would result in a stage lowering of only one (1) foot or to elevation 99.5 for the same storm.

Lowering the emergency spillway to 98.0 would result in floods spilling over it once every year or two and twice during some years. The material in the emergency spillway at this elevation is very sandy and very erodable and would become gullied and subject to washing out in a short time. The necessary protective measures which would have to be constructed to hold the emergency spillway at this lower elevation would be expensive.

Sincerely yours,

LEON GARY
Director

/esr

December 7, 1938

General file

MEMORANDUM

TO : Mr. Ira E. Myers, Chief Engineer

FROM : Cayce B. Sexton, Structural Design Section

SUBJECT: Preliminary estimate of construction cost for the proposed gated spillway for the existing Sandhills Lake, Beauregard Parish

NOTE: See attached sketches.

1.	Clearing and Grubbing	=	0	Acres	@ $100.00	=	$1,800.00
2.	Channel Excavation	=	85,000	Cu.Yds.	@ 0.40	=	34,000.00
3.	Structural Excavation	=	30,000	Cu.Yds.	@ 1.25	=	37,500.00
4.	Filter Materials	=	500	Cu.Yds.	@ 12.00	=	6,000.00
5.	Steel Sheet Piling	=	8,825	Sq.Ft.	@ 4.00	=	35,340.00
6.	Timber Piling	=	13,140	Lin.Ft.	@ 3.50	=	45,990.00
7.	Reinforcing Steel	=	477,000	Lbs.	@ 0.20	=	84,400.00
8.	Concrete	=	3,160	Cu.Yds.	@ 65.00	=	204,750.00
9.	Trash Screen	=		Lump Sum		=	10,000.00
10.	Handrailing and Misc.	=		Lump Sum		=	10,000.00
11.	60' x 27' Tainter Gate	=	2	Each	@ $35,000.00	=	70,000.00
12.	Tainter Gate Hoist	=	2	Each	@ $20,000.00	=	40,000.00
13.	Electrical Installation	=		Lump Sum		=	10,000.00
14.	Backfill	=	10,000	Cu.Yds.	@ 0.60	=	6,000.00

DJL

15.	Seeding or Sodding	-	2 Acres @	$300.00	= $ 600.00
16.	Gravel	-	265 Cu.Yds.@	10.00	= 2,650.00
17.	Riprap	-	1,300 Tons @	18.00	= 23,400.00
				TOTAL	= $632,430.00

/an
Attachments

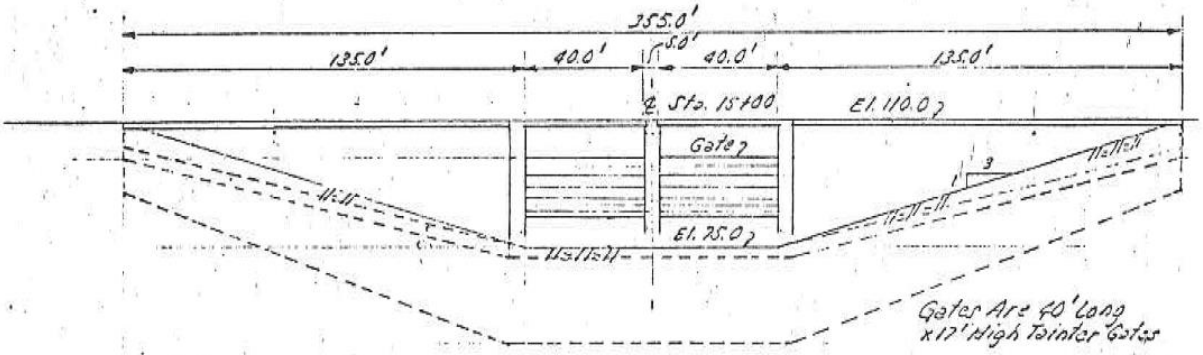
cc - Mr. Daniel V. Crosap
Mr. George T. Johns
Mr. C. K. Oakes

ENGINEERING DIVISION

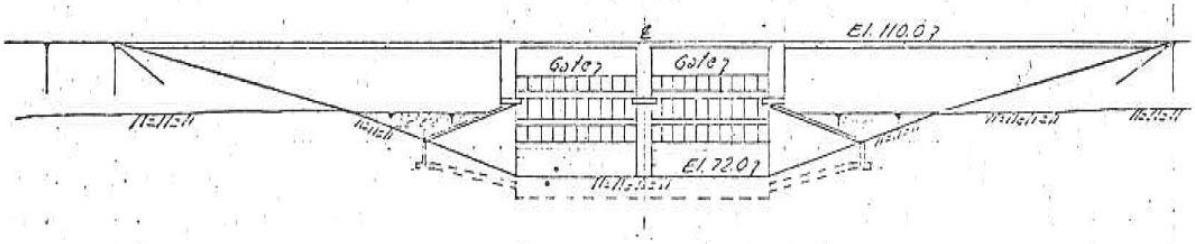
DPW 24 — Page No. 2

PARISH	COMPUTED BY	DATE
Beauregard	Sexton	11-28-66
SUBJECT	**CHECKED BY**	**DATE**
Bundicks Lake Gated Spillway		

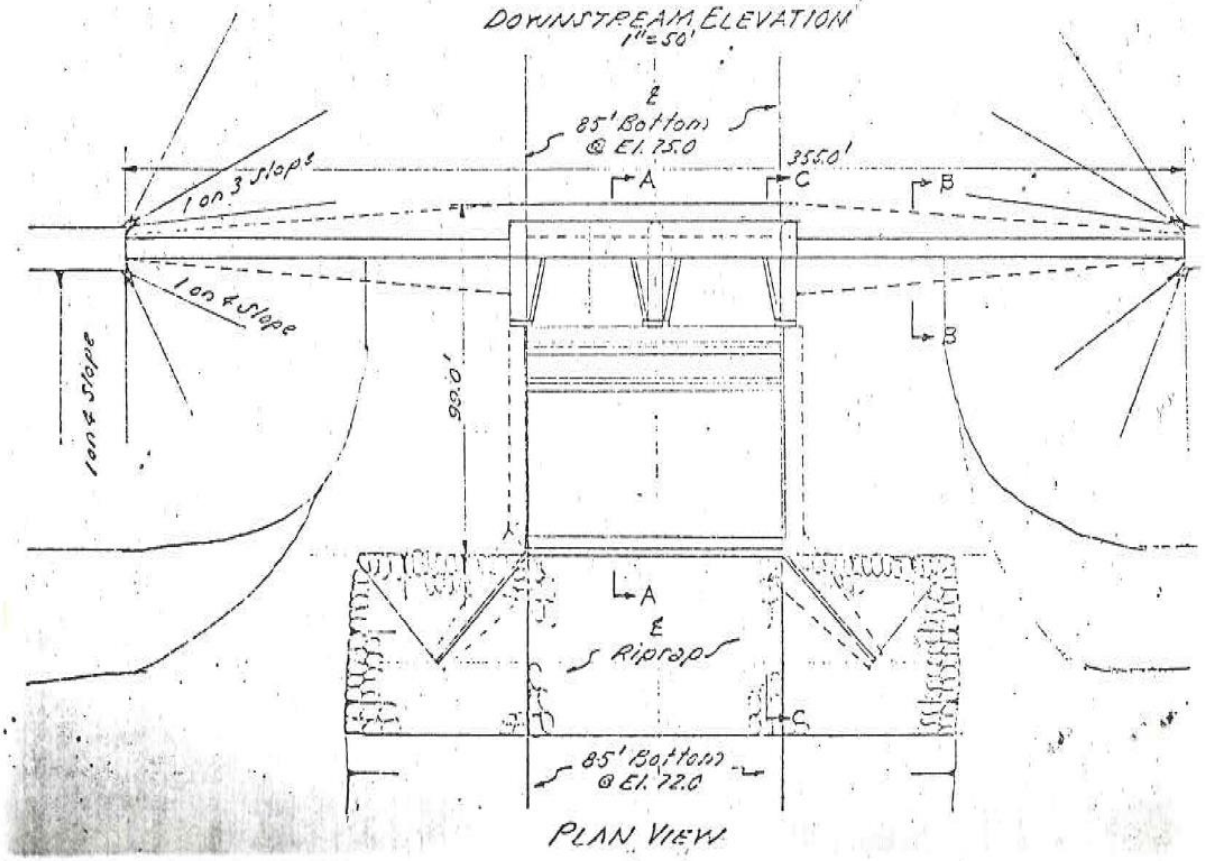
Sketches



UPSTREAM ELEVATION
1" = 50'



DOWNSTREAM ELEVATION
1" = 50'



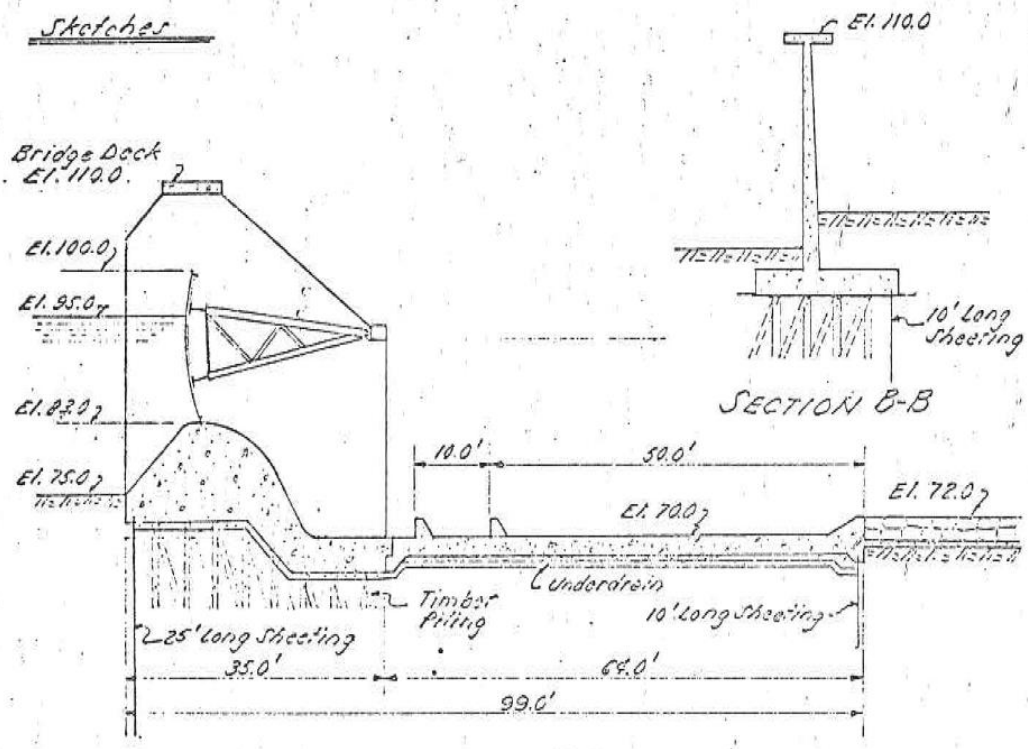
PLAN VIEW

ENGINEERING DIVISION

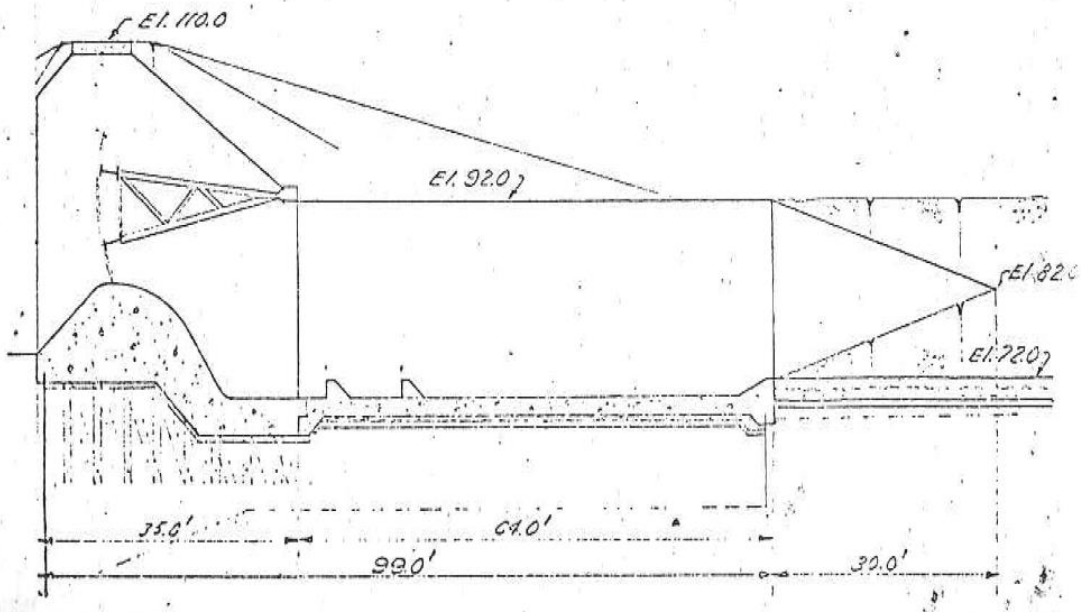
DPW 24 Page No. 3

PARISH	COMPUTED BY	DATE
Beauregard	Sexton	12-1-66
SUBJECT Bundicks Lake Gated Spillway	CHECKED BY	DATE

Sketches



SECTION A-A
1" = 20'



VIEW C-C
1" = 20'

April 17, 1962

Mr. J. B. Ledoux, Chairman
Bundicks Game and Fish Commission
202 Wilson Street
De Ridder, Louisiana

Dear Mr. Ledoux:

It has been brought to my attention that an increasing number of camps are being constructed in subdivisions along the perimeter of Bundicks Creek Lake at floor elevations which are not sufficiently high to avoid flooding during surcharges of the lake level. You are therefore requested to give some publicity to this matter so that future builders of camps will take into account the higher lake levels which may be expected temporarily as result of rainfall in the Bundicks Creek watershed.

The lake pool stage is elevation 95.0 feet above mean sea level. The lake may be expected to remain at or a matter of a few inches above that level for the greater part of each year. However, the lake level may be expected to rise temporarily to an elevation of 100.0 feet above mean sea level once every 10 years, and to a level of 103.0 feet above msl once in 20 years. The maximum rain storm of record occurring over the entire watershed would raise the lake level to a height of 107.0 feet above mean sea level.

There is nothing greatly wrong with the location of a camp on a lakefront lot having an elevation of say 98.0 to 103.0 feet above mean sea level. Any buildings constructed on such parcels of ground should be so constructed as to have a floor level of not less than 105.0 feet above msl. On the lots only a few feet above pool stage (lots having general elevations of 96.0 to 100.00 feet above msl), the adoption of a piling-supported

structure raised so as to permit use of the area under the camp except during high lake stages is most adaptable. It is also obvious that access to the low-lying lots or camp sites will be temporarily cut off except by boat.

Your assistance in making this information known to developers of subdivisions, docks and boat sheds, and to the general public, will be greatly appreciated.

Yours very truly,

CLAUDE KIRKPATRICK
Director

/hb
cc - C. K. Oakes
T. C. Morgan